

Final year study project (PFE) 2020-2021

Socio-cultural arguments and management strategies for river conservation



Lacusrian village of Ganvié (Benin) (personal photography). Each household has a fishery area. Men are exploiting it and provides food for their family, women are cooking and selling the rest on markets on water.

**Socio-cultural arguments and management
strategies for river conservation: perspective
from legal rights and community-based
management**

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AVERTISSEMENT

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- Accroître leurs compétences en matière de pratique professionnelle par la mobilisation de connaissances et de techniques, dont les fondements et contenus ont été explorés le plus finement possible afin d'en assurer une bonne maîtrise intellectuelle et pratique,
- Accroître la capacité des ingénieurs en génie de l'aménagement et de l'environnement à innover tant en matière de méthodes que d'outils, mobilisables pour affronter et résoudre les problèmes complexes posés par l'organisation et la gestion des espaces.

La formation par la recherche inclut un exercice individuel de recherche, le projet de fin d'études (P.F.E.), situé en dernière année de formation des élèves ingénieurs. Cet exercice correspond à un stage d'une durée minimum de trois mois, en laboratoire de recherche, principalement au sein de l'équipe Dynamiques et Actions Territoriales et Environnementales de l'UMR 7324 CITERES à laquelle appartiennent les enseignants-chercheurs du département aménagement.

Le travail de recherche, dont l'objectif de base est d'acquérir une compétence méthodologique en matière de recherche, doit répondre à l'un des deux grands objectifs :

- Développer toute ou partie d'une méthode ou d'un outil nouveau permettant le traitement innovant d'un problème d'aménagement
- Approfondir les connaissances de base pour mieux affronter une question complexe en matière d'aménagement.

Afin de valoriser ce travail de recherche nous avons décidé de mettre en ligne sur la base du Système Universitaire de Documentation (SUDOC), les mémoires à partir de la mention bien.

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INTRODUCTION

Rivers are the cradle of civilization, and humankind have settled near them for thousands of years. Rivers not only sustain our food, transportation, domestic use of water, and provision of electricity (Grill et al. 2019), they also provide a fundamental base of our recreational activities, traditions, beliefs, and for many cultural values. Cultural values can be highly diverse, and if primary river services depend on the biological and ecological condition of the river, it is also the case for cultural values (Wantzen et al. 2016). Nonetheless, hydrosystems are now suffering under human activities, including the settlement of dams, intensive agriculture, water pollution, mining, sparking essential river process and function loss, and causing the decline of ecosystem services (Grill et al. 2019). Moreover, the degradation of wetlands also triggers a socio-cultural degradation of livelihood (McInnes, Ali, and Pritchard 2017). Hence, preservation efforts need to be deployed on two levels: on the level people's needs and on that of the environment (Ramsar 2008). Therefore, different management methods are employed in various parts of the world, favoring harmonious cohabitation between people and free-flowing rivers. Parallely, several methods are being developed to assess the culture that is linked to healthy rivers, which is likely to become more numerous in the future (Taras, Rowney, and Steel 2009) until one can be used universally. Those methods implement a score to several indicators of a river attribute linked with a cultural value. Eventually, the final score of "cultural health" of a river would help to determine priorities for environmental flow restoration.

This paper focuses on "successful" river management examples found on an international scale. Two main categories of management methods are analyzed. The first being: restoration of environmental rights, which can go so far as to declaring a river to be a legal person. The second method are community-based initiatives in river basin management. The former can be characterized as a top-down approach, and as a trial to simultaneously accommodate legal and cultural interests at the same time and ease collaboration between states and local communities (Macpherson and Clavijo Ospina 2020). The latter is more of a bottom-up approach where local communities' point of view influences the management plan's decision-making processes (Robinson et al. 2015). Above all top-down approach, conferring legal personality to a river was applied quite recently (first internationally recognized case in 2017) even if Christopher Stone arose this idea in 1972 (Iorns Magallanes 2018) whereas community initiatives do not have a specific date of emergence. The issue remains in knowing which method is better adapted to preserve rivers and the socio-cultural values of the people living alongside them. Do the methods correspond to specific strongness or type of values (meaning that conferring legal rights to a river employ more important socio-cultural arguments to be implemented than community-based initiatives or the contrary)? Can a prototype assessment method differentiate the two management systems by giving scores to the level of importance or endangerment that cultural values linked to rivers face?

The argumentation in the present paper is divided into two parts. This supports the hypothesis that management techniques are territorially linked, that they need local involvement and thus do correspond to specific cultural values. The first part concerns the

environmental rights method of which there are examples in New Zealand, India, Ecuador, and Colombia. The second part involves the river basin governance method that is supported by community participation in Murray-Darling basin (Australia), Fitzroy river (Australia), Mekong (South-East Asia) river basin, and Indus river (Pakistan) . Comparing the two categories will highlight the advantages and drawbacks of each and determine whether they correspond to a specific socio-cultural argumentation for river conservation.

METHODOLOGY

An initial set of scientific papers was provided by Dr. Karl Wantzen and Mr. Alvin Manuel Vazhayil, who also shared information from their previous work. The search engine “Google Scholar” was used to find relevant bibliographic sources using the following keywords to find relevant case studies: “legal person,” “river management,” “community-based,” “participatory method” connected by the boolean operator “and”. This first research revealed three hundred sixty-five thousand results for legal rights in which were selected around ten relevant articles of the first two or three pages upon the number of times they have been cited, abstract, introduction and conclusion. A similar research was undertaken for community-based initiatives revealing eight hundred sixteen thousand results. Four of them permitted to defined case studies. Findings were then narrowed down by applying the following filter: “cultural values” and then geographical filters “Whanganui”, “Ganga”, “Atrato”, “Vilcabamba” for legal right status for rivers and “Murray”, “Martuwarra Fitzroy”, “Mekong” and “Indus” for community-based initiatives.

The scoring method used in this paper is inspired by the previous paper (Bourda 2020): “Cultural and social criteria for hydrosystems preservation.” It encompasses several dimensions including the link with free-flowing and hydro systems biodiversity, the number of people concerned, settlement or use, the level of endangerment and when possible, the surface area concerned, the frequency of occurrence, and the local social importance.

RESULTS, PART ONE: RIVER RIGHTS AND LEGAL PERSONALITY

The designation of rivers as legal personality came to be known with the Whanganui River designation by legislation in 2017. Both academic and political attention has been given to this case (Macpherson and Clavijo Ospina 2020) and India followed the lead a few days later. It enables the water to have standing in Court and interests of the river can be defended and protected. In some of the cases restoring environmental rights is also a mean to restore indigenous sovereignty (Hsiao 2012). This section presents Whanganui, Ganga and Yumana rivers declaration as legal personality and Atrato and Vilcabamba river recognition of their rights.

Cultural arguments, main stakeholders, practical outcomes and remaining missing elements are summarized in Table 1.

New Zealand: Whanganui River

New Zealand's history is marked by British colonization bringing that impacts their political, economic, legal, and socio-cultural lives. This culture is noticeably different and often incompatible with that of the local indigenous communities, such as the Māori that are present in the territory (Iorns Magallanes 2018). This move has led to the conversion of wildlands into fields and gardens and “disrupted traditional and customary forms of governance” (Hsiao 2012). The Māori have protested against these changes for over a century. However, the Crown did not consider them and continued to pass legislation that went against their customary rights (Hsiao 2012). In 1840, The Treaty of Waitangi was passed. It was supposed to shape the relationships between the Māori and the Crown. The treaty was negotiated once more in 1987, culminating in 2012 and was finalized in 2014 and in force as of 2017 through the *Te Awa Tupua Act*. The expression reflects the Māori view of the river as a whole (Iorns Magallanes 2018). In this act, the Whanganui River, the longest navigable river in New Zealand, is recognized as a legal person and thus can be represented in court. Therefore, compensation can be demanded if harm is inflicted against the river, and monetary compensation would be meaningless. The polluter would rather have to remediate a site (Hsiao 2012). New Zealand was the first country to give a legal personality to a river (Hutchison 2014). Additionally, the Act enabled a 200 000\$ fund to be paid each year for 20 years (Colwell, Carr-Wilson, and Sandborn 2017).

The indigenous community *Iwi* strongly believes that the river is a living entity and that lifeforce was drawn from the headwaters of the Whanganui River. Their values helped to recognize environmental issues surrounding rivers, and the local community constituted the action's motor (Hsiao 2012). Their relation to the river and the belief that they are interconnected with the river enabled this shift in society view (Hutchison 2014). It is encompassed in their proverb: "Ko au te awa. Ko te awa ko au," which means “I am the river, the river is me”. In this case, the act helped restore environmental rights and sparked indigenous sovereignty restoration (Hsiao 2012).

However, even after a century of protests and years of negotiation, practical results still need to be defined (Colwell, Carr-Wilson, and Sandborn 2017). Even though the Whanganui River was recognized as a living being in its entirety and the Iwi community's traditional beliefs were recognized, the act also protects existing private property. It does not consider annexed components (Shelton 2015) and this at odds with the river's declared indivisibility (Colwell and Carr-Wilson 2017). Nonetheless, the question of whether the rights of the Whanganui river were established mainly to correct past irreversible colonial mistakes is a controversial topic (Chaturvedi 2019).

India: Ganga and Yumana Rivers

Two Indian rivers were also conferred a legal person's rights on the 22nd and 30th of March 2017 by the Indian High Court of Uttarakhand (Kothari and Bajpai 2017), however the judgment has been suspended to this day by the Supreme Court (Chaturvedi 2019). The High Court underlined three main arguments: the negligence of states regarding river governance, the necessity to protect the environment and Indian religious law, and the spiritual significance of the rivers (Iorns Magallanes 2018).

For instance, the Ganga and Yamuna rivers are considered to be sacred for Hindus. This is illustrated by the holy bath that leads millions of Hindus to go into the water four times in four different localities every twelve years. Every day, the Ganga provides water for over 500 million people. The Indian jurisdiction already recognized Hindu idols and ruins as legal persons; thus, giving suitable context for giving the same rights to rivers (Colwell, Carr-Wilson, and Sandborn 2017). Moreover, embedded in their religion is the belief that as long as the world will sustain natural features, humans will survive. This results in Hindus respecting nature and maintaining healthy environmental protection habits because of this sense of duty and not in the name of environmental rights or restoration per se (Chaturvedi 2019).

Nonetheless, the water is contaminated. Varanasi and Prayag are known to be locations where dead bodies are thrown into the river (Iorns Magallanes 2018). Additionally, three billion liters of wastewater is dumped into the river every day (Colwell, Carr-Wilson, and Sandborn 2017). Further common pollutants have been listed below for Ganga river:

- *Domestic, industrial, and solid waste is thrown directly into the river;*
- *Non-point sources of pollution from agricultural runoff containing residues of harmful pesticides and fertilizers;*
- *Animal carcasses and half-burned and unburned human corpses thrown into the river;*
- *Defaecation on the banks by low-income people; and*
- *Mass bathing and ritualistic practices.*

(Chaturvedi 2019)

The declaration did not define the implications of the measure precisely. Unlike Whanganui declaration, the Ganga and Yumana rivers designation as legal personality was debated only during a day and adopted by Uttarakhand High Court. The language used is vague and does not explicitly name the consequences for transgressions. There is also a risk to spark negative consequence especially for the poor contributing to pollution of the water, in the preservation efforts of the river. In fact, a possible prosecution or displacement of those population close to riverbanks might be needed, causing significant social and economic impacts (Colwell, Carr-Wilson, and Sandborn 2017).

Colombia: Atrato River

The constitutional Court of Colombia declared in November 2016 that the Atrato river basin possesses the “rights to protection, conservation, maintenance and restoration” (Vargas-Chaves et al. 2020). It also emphasises on the intrinsic link between humans and nature. The judicial sentence occurred in response to illegal mining activities resulting in pollution and threatening the livelihoods of many people. It was voiced by “Tierra Digna,” the center of studies for Social Justice (Cano Pecharroman 2018), which represented Community Councils and associations against the President, Ministries, and municipalities (Vargas-Chaves et al. 2020). Local communities were therefore the initiators of these actions through petitioning. It was done for rights to life, wellbeing, and a healthy environment and culture (Vargas-Chaves et al. 2020). The range of arguments that helped to allocate a legal personality to the river stemmed from the cultural and territorial rights of local communities. For instance, they suffered from activities going against their traditional practices and social structures (Iorns Magallanes 2018). Consequently, the Court tried to impose the state to take adequate measures (Iorns Magallanes 2018). Conversely these actions might threaten the lives of thousands of families who depends on illegal mining (Colwell, Carr-Wilson, and Sandborn 2017).

Ecuador: Vilcabamba River

The first country to declare that nature is subject to rights (Shelton 2015) was the Provincial Court of Loja in Ecuador. It recognized the Vilcabamba River’s constitutional rights in 2011 (Colwell, Carr-Wilson, and Sandborn 2017). The Provincial Government of Loja was dumping construction material directly into the river, causing pollution of its waters, restricting its channel, and flooding. The debris came from highway construction using heavy machinery and dynamite (Cano Pecharroman 2018). Consequently, citizens brought this to Court. The judge recognized that the “rights of nature had been violated”, more specifically, nature’s right “to exist, to be maintained and to the regeneration of its vital cycles, structures, and functions.” (Cano Pecharroman 2018 p.7). However, the intent to express indigenous concepts (Iorns Magallanes 2018) did not stop road construction.

Table 1: Comparison table of main characteristics and cultural outcomes for conferring legal rights to the river

	Whanganui river	Ganga and Yamuna rivers	Atrato river	Vilcabamba river
Arguments in favor of giving legal status to the river	Local Maori Iwi consider the river sacred (Shelton 2015). Local Maori Iwi consider the entire entity as a living being (Shelton 2015). Local Maori Iwi have claim possession of the river for centuries for both its tangible and intangible treasures (Shelton 2015). Importance of spiritual values for Maori Iwi	Spiritual significance of the river, sacred status of the river (Iorns Magallanes 2018) Importance of religion law (Iorns Magallanes 2018) Millions of people depending on its resources (Kauffman and Martin 2018) Establishment of legal personhood for Hindu deities (Kauffman and Martin 2018) Whanganui River legal personhood status (Kauffman and Martin 2018)	The recognition of indigenous group and biodiversity, cultural, and humanitarian guarantees in the Constitution. (Kauffman and Martin 2018) “Spiritual importance of natural resources and the environment for many cultures” (Kauffman and Martin 2018 p.11) Indigenous harmonious life and interconnection with the environment (Lalander 2014) Whanganui River legal personhood status (Kauffman and Martin 2018)	Indigenous harmonious life and interconnection with the environment (Lalander 2014) River sacred for indigenous people (Colwell, Carr-Wilson, and Sandborn 2017) Indigenous reference of the river as Pachamama ¹ Constitutional rights of nature (Colwell, Carr-Wilson, and Sandborn 2017)
Main stakeholders	Maori Iwi (local tribe) Central and local government	Indian High Court of Uttarakhand State representatives (Residents)	Constitutional Court “Tierra Digna” Residents Humboldt Institute WWF Colombia Community Council of the Integral Peasant Association of Atrato Association of Community Councils of Bajo Atrato Inter-Ethnic Forum of Choco Solidarity	Court Citizens
Practical consequences	Legal standing and independent voice Impossibility for the river to be owned (Shelton 2015) Two “guardians” to protect its status, health and wellbeing (one	Mining ban in Ganga’s riverbed and highest flood plain (Kauffman and Martin 2018)	Creation of “the Guardians of Rio Atrato” ³ with experts’ help (Kauffman and Martin 2018)	Right to sue the offender of rights of Nature ⁵ Injunction to the Provincial Government to repair damages (Colwell, Carr-Wilson, and Sandborn 2017)

¹ “Indigenous concept that views humans as part of nature/earth and nature as having intrinsic rights.” (Colwell, Carr-Wilson, and Sandborn 2017)

³ “In order to protect and restore the Rio Atrato, a Commission of the Guardians of Rio Atrato must form within three months and include two designated guardians as well as an evaluation team from the Humboldt Institute and WWF Colombia, both of which had worked in the Rio Bitá de Vichada region.” (Kauffman and Martin 2018)

⁵ “The ruling recognized the plaintiff’s right to sue on the basis of Article 71 of the constitution, which establishes every citizen or nation’s right to demand the authorities the compliance with the rights of nature. The ruling recognizes the rights of nature as a constitutional right to be observed and emphasizes that every citizen can defend such rights in court when violated” (Cano Pecharroman 2018 p.7)

	representing The Crown and one representing Maori Iwi) (Shelton 2015) Provision of legal forum ² Provision of guidance to decision-makers (Shelton 2015) 200 000\$ fund to be paid each year for 20 years (Colwell, Carr-Wilson, and Sandborn 2017).		Creation of five committees to implement policies ⁴	
Missing elements	Practical protocol Legislation for private owners Penalization system	India does not recognize rights of Nature in its constitution (Kauffman and Martin 2018) Clear determination of liability when damages occur and fair sharing of responsibilities ⁶ (Kauffman and Martin 2018) Civil participation and socio-cultural consideration Practical protocol Penalization system	Colombia does not recognize rights of Nature in its constitution (Kauffman and Martin 2018) Penalization system	Ecuador does not recognize rights of Nature in its constitution (Deleuil 2020) Efficient enforcement of ruling (Cano Pecharroman 2018) Emphasis on indigenous interests

² “The 2017 Act confers legal personality on the river system, giving it a unique legal status; it recognises not only the need to protect the ecosystem it represents, but also to provide a legal forum through which to implement Maori cultural and spiritual attitudes to the relationship of land and people” (Rodgers 2017)

⁴ Five committees representing appropriate government institutions were created to coordinate and implement policies relating to the river, including de-contamination (Ministry of Environment); eradication of illicit mining (Ministry of Defense); food security (Ministry of Housing); and toxicology and epidemiology studies (Ministry of Health) (Kauffman and Martin 2018)

⁶ “The primary complaint appears to be that Uttarakhand authorities do not wish to be held accountable for the Ganga and Yamuna rivers” (Kauffman and Martin 2018 p.15)

Advanced arguments concerning cultural values

In three of the four case studies explored, the indigenous population's reciprocity and respect for nature are highlighted. It is especially the case in Latin America and New Zealand but can also be encountered in Asia or Africa (Cano Pecharroman 2018). Recognition of river rights is an excellent way to bring awareness about indigenous communities' beliefs. These beliefs represent important factors in the recognition process (O'Donnell and Macpherson 2019). In the examples of Latin America, indigenous groups do not believe in Man and Nature's duality and cannot understand the occidental tendency to exploit nature or buy lands (Chaturvedi 2019). The spiritual value of the river is assessed in every example. For India and New-Zealand, the river is sacred, and for Colombia and Ecuador (which have the same origins for their indigenous communities), the river is part of their philosophy of life in harmony with nature.

However, the "interconnection" with water is almost completely absent from non-indigenous western countries population. More than that, nature and culture can, in their definition, be presented in opposition. Redefining those terms and provide sufficient educational background to slowly and profoundly transform the way we value water might be necessary.

Discussion

The four different case studies have different contexts, thus also different justifications for awarding rights and personality to rivers (Iorns Magallanes 2018). They all helped shift from an anthropocentric perspective (human beings are the most valuable and only reason for the existence of a legal system and natural resources are simple objects) to a socio-ecosystem perspective where humans are part of the ecosystem (Maass 2017).

Clearer rules have been implemented in the case of New Zealand. It is also a country that has more economic resources and infrastructure to support river preservation than many of its other southern hemisphere counterparts. On the one hand, there is a more significant concern for Colombia and Ecuador to implement the river preservation methods and conserve their available resources. This is more certainly determined by actors' interests (Colwell, Carr-Wilson, and Sandborn 2017). On the other hand, such a declaration is quite specific to indigenous societies and legal systems. In Global North countries, the Constitution might be less flexible, and the language translation of cultural values not as applicable (Colwell, Carr-Wilson, and Sandborn 2017). In terms of rights, countries should first begin to honor treaties between indigenous and non-indigenous people especially regarding the water resource. Then legal recognition, in previous examples, either came from negotiation of settlements, application of already common-law precedents or the legal translation of rights of nature (Colwell, Carr-Wilson, and Sandborn 2017). Reopening Constitution writings might be unconceivable for western countries, nonetheless complaint, suing and appeal procedures

could be extended and administratively eased to defend natural rights or at least human rights to a healthy environment.

Limits of the approach

The management action is still relatively recent and requires more time to address certain practical matters (river wins trial, compensation for environmental and cultural damages to the river person) through a shift in the law (Cano Pecharroman 2018). Nonetheless, even if the legal system has adopted rights, industries are still developing, and more and more social conflicts will emerge with local communities (Cano Pecharroman 2018). Thus, the Court might not be the best institution to deal with such issues. There is no way to ensure that acts and decisions will be followed efficiently, and there are often not enough resources available (Iorns Magallanes 2018). For example, in front of other interests such as private property, conferring legal rights might not be sufficient to win a trial (Hutchison 2014).

Furthermore, “there cannot be a legal procedure for deep ecology which is in the realm of philosophy and culture.” (Chaturvedi 2019). This issue is illustrated with the Ganga river, where its holiness did not stop its pollution. The inherent problem lies in the fact that there are no strong actors or willingness to implement existing frameworks. Hence, only solutions that are upheld strongly by powerful institutions can solve this problem (Chaturvedi 2019). Even in the legal sphere, there are issues concerning how nature can sue someone and who would stand responsible for failure in restoring river health and flow. How and in which dimensions can rivers be legally assured to regain their natural dynamics?

RESULTS PART II: COMMUNITY-BASED INITIATIVES

There is a growing interest in participatory or bottom-up approaches (Robinson et al. 2015). It was highlighted in Agenda 21 signed by 172 governments, on chapter 26: “Recognizing and strengthening the role of indigenous people and their communities”:

Their ability to participate fully in sustainable development practices on their lands has tended to be limited due to economic, social, and historical factors. Given the interrelationship between the natural environment and its sustainable development and the cultural, social, economic, and physical well-being of indigenous people, national and international efforts to implement environmentally sound and sustainable development should recognize, accommodate, promote and strengthen the role of indigenous people and their communities.

Following this recommendation, River Basin governance actors implemented strategies to take local communities’ expertise for river management. Cultural arguments,

main stakeholders, practical outcomes and remaining missing elements are summarized in Table 2.

Australia: Murray-Darling basin

During the late 1980s, an intergovernmental agreement by a Ministerial Council made up of ministers from each state and the Murray-Darling Basin Commission, created in response of issues of administration of a basin split between five different states the Murray-Darling Basin Initiative. In this initiative, the Ministerial Council is in charge of policy decisions with the support and advices of the Murray-Darling Commission. It recognized the importance of community involvement but surprisingly did not define its implications, thus evaluation of practical outcomes is impossible (Chenoweth, Ewing, and Bird 2002). Nonetheless, from then on, more visibility was given to cultural values based on rivers. Those were used to “motivate unique partnerships of private landowners, public agencies, and other stakeholders” (Robinson et al. 2015; p. 2214). The overall governance structure enables community involvement. The Community Advisory Committee is in charge of communication between the communities and the Council. They organize public workshops, and local inhabitants are informed through accessible written material and a website (Chenoweth, Ewing, and Bird 2002).

In the Barmah-Millewa region, where forests and wetlands hold unique cultural values for local communities, indigenous views are taken into account via the Indigenous Reference Group (Robinson et al. 2015). The Murray-Darling Basin Commission, after public consultation, consequently changed the reinforcement environmental values plan. The Ministerial Council supported these actions and encouraged similar methods. In this way, indigenous people could impact wetlands management decisions, even though the Basin Commission and the Ministerial Council still have the final say (Chenoweth, Ewing, and Bird 2002).

The indigenous communities deeply believe that “the health and recovery of the river ecosystems and Indigenous Nations’ access to it are central to the spiritual, cultural, social, and economic survival of the Indigenous Nations of the Murray” (Morgan, Strelein, and Weir 2004 p.17-18). Indigenous interviews highlight its importance:

What is the significance of the River Murray to you?

- *The river is central to the culture of Indigenous Nations who have traditional custodial responsibility for the Basin. It provides their identity and spirituality. “It is our lifeblood.” “It is life.” “Our beliefs are entwined in the river itself.” (Morgan, Strelein, and Weir 2004 p.84)*

Australia: Martuwarra Fitzroy River

The Martuwarra Fitzroy River Council was created in 2018 by Traditional Owners as a governance system to “maintain the spiritual, cultural and environmental health of the catchment” (Poelina, Taylor, and Perdrisat 2019). It is the result of The Fitzroy River Declaration of 2016 whose purpose is to protect both environmental and cultural values linked to the river. The term *Martuwarra* refers to a life force representing all vital values for indigenous communities. These include ancestral beings, cultural heritage, education, health, food and medicine. However, their lifestyle is endangered not only by water extraction but also by many modern activities developing in the region, including mining, intensive agriculture and dams. To tackle those issues, the declaration proposed a prevention zone alongside the water. Although the western Australian Labor party supports the declaration, it did not introduce it to state law and settled plans remaining insufficient for Traditional Owners (Poelina, Taylor, and Perdrisat 2019).

Indigenous aboriginal groups follow a governance system called First Law which focuses on earth health on the principle that “the priority of law is to protect and manage the sustainable harmony of the land over the self-interests of humans” (Poelina, Taylor, and Perdrisat 2019).

South-east Asia: Mekong River basin

Since 1995, the Mekong River is managed by an international River Commission comprising of Thailand, Cambodia, Laos and Vietnam. China and Myanmar are still not a part of it. As is the case with the Murray-Darling basin, Public Participation in the context of the Mekong River Commission document recognized the importance of community participation in river planning (Chenoweth, Ewing, and Bird 2002). The Integrated Water Resource Management-based Basin Development Strategy (2016-2020) and the Mekong River Commission Strategic Plan (2016-2020) are supposed to shape water resource development. In the past, local communities were already using participatory methods in line with Hindu and Buddhist principles of non-violence and respect for nature. It helped balance the resources and the preservation of the environment until the region's industrialization (Bruch et al. 2005).

A local irrigation system called Muang Faai in Thailand was created and used for centuries. It guaranteed a fair distribution of water while preserving the forest. However, the traditional participatory management was replaced by an insufficient top-down approach (Budryte, Heldt, and Denecke 2018). For instance, water sources managed by local inhabitants are in better condition than 550 000 water sources across the Thai Government's country (Bruch et al. 2005).

Pakistan: Indus river dolphins

In the river Indus, active participation of communities along the water helped preserve its endemic river dolphins threatened by “worsening water pollution, stranding in irrigation canals, and accidental capture in fishing nets”. Numerous institutions and programs also help to manage actions including WWF-Pakistan and the Sindh Wildlife Department dolphin rescue program (WWF 2017). Population assessments were conducted, and local communities shared further information.

Indigenous minorities along the river highly depend on natural resources including fishing (Waqas, Malik, and Khokhar 2012). The construction of dams from the Indus Basin Treaty in 1960 to now on is downsizing the number of fish available in the Indus streams and lakes (Wagha 2012). Moreover, their rights are not always defended by the Government, imposing Islamic code upon other religions (Minority Rights Group International 2010).

Table 2 : Comparison table of main characteristics and cultural outcomes for community-based initiatives and governance

	Murray-Darling basin	Fitzroy river	Mekong river	Indus river
Arguments in favor of the initiative	Difficulties in governance Intergenerational spiritual interconnection to the river and protection of heritage (Morgan, Strelein, and Weir 2004) Improve social outcomes including for recreational activities (Morgan, Strelein, and Weir 2004)	River considered as sacred living and ancestral being (Poelina, Taylor, and Perdrisat 2019) Maintain spiritual and cultural health of the river alongside with environmental health (Poelina, Taylor, and Perdrisat 2019) First Law	Use “full potential of sustainable benefits of the water and related resources: Mekong river development (Chenoweth, Ewing, and Bird 2002) Society’s concerns about the Mekong river and willingness to be part of the decision process (Budryte, Heldt, and Denecke 2018) Buddhism ⁷ Traditional participatory approach (Budryte, Heldt, and Denecke 2018)	Hinduism and Buddhism Indigenous communities dependance on water resources and especially fishing activity (Waqas, Malik, and Khokhar 2012) Enforcement of community awareness (Braulik et al. 2015)
Main stakeholders	Murray-Darling Basin Commission Ministerial Council Population	Traditional Owners Martuwarra Fitzroy River Council Kimberley Aboriginal Law and Culture Centre	Ministerial Council Joint Committee Secretariat Population	Population
Practical consequences	Inter-state governance Access to governance information for population ⁸	Proposition of protection area (Poelina, Taylor, and Perdrisat 2019) Collaboration of Aboriginal people and institutions	International governance Access to governance information for population	Use of indigenous knowledge None for integration of tribal cultural values
Missing elements	Clear definition and threshold for a satisfying population participation (Chenoweth, Ewing, and Bird 2002)	Practical solution for culture integration	Equity in access to information (Chenoweth, Ewing, and Bird 2002) No injunction for states for application of recommendations (Budryte, Heldt, and Denecke 2018)	Recognition of indigenous cultural values linked to fishing

⁷ “The dominant religion in the region - Buddhism - gives a soft approach with a strong link to the conservation and eco-friendliness” (Budryte, Heldt, and Denecke 2018 p.352)

⁸ “The combined efforts of the Community Advisory Committee and the Communications and Consultation Unit have ensured that the general public is usually satisfied with the extent of access to information about management of the Murray-Darling basin” (Chenoweth, Ewing, and Bird 2002 p.503)

Advanced arguments concerning cultural values

In each of the examples presented above, population either have a strong cultural and spiritual link to the river or mainly rely on it for livelihood. They particularly feel concerned by water issues. This is certainly why their desire to participate to management is high. For western countries, concern might arise more from a desire to protect environment per se or protect recreational or resource use. From this difference, may arise a lack of interest of western population. However, their cultural values and activities remain in danger being fishing, bathing, or relaxation. Against pollution in France for example, it is not rare that fishers' union make a complaint against identified polluters. They do so because they are at the same time warrant of biodiversity and aquatic ecosystems health and of recreational fishing.

Discussion

A wide range of advantages emerge from community participation. It is the result of two principles: first, the argument of numbers. If more people are engaged in reflecting on a problem, there is a higher probability of finding a solution. Secondly, local groups are usually more capable of determining the most relevant strategy for themselves if sufficient information is accessible. As information is becoming more accessible, people have started to question governmental decisions (Forgie, Horsley, and Johnston 2001). "By working together, people can achieve more than individuals or organizations working on their own, and involving those affected is likely to result in a better and more acceptable long-term solution" (Forgie, Horsley, and Johnston 2001, p.6). Even if there is no undoubtable proof that participatory methods lead to good governance, they are still supporting each other (Bruch et al. 2005).

Limits of the approach

Apart from a lack of volunteering, communities might also lack information, expertise, networking or funding to take a decision (Conrad and Hilchey 2011). To be effective, community initiatives still need to be supported by a governance system and an institution capable of finding relevant resources for data collection and coordinating multiple actors (Robinson et al., 2015). In this perspective, initiatives should draw from both bottom-up and top-down approaches. Relevant government institutions can inform, acknowledge and find funding for community-based management and Academic Institution can bring skills and relevant expertise (Conrad and Hilchey 2011).

ASSESSING CULTURAL VALUES

Comparing and scoring cultural values from different sites is quite challenging and generally requires further data and interviews to grasp the extent of the value. Nonetheless, preliminary literature research can draw global features of previous indigenous groups spiritual link with rivers and underline (or not) any similarity or dissimilarity between cultural arguments advanced in management strategies.

In each of the examples cited above, the river sustains a large part of indigenous needs. Everywhere across the world, hydrosystems have their importance in economic, social, and cultural life of population. However, their relationship to the entity is different by nature. Sometimes deeply and long anchored in religion, it can also be part of philosophy and respect of the river as an ancestor or deity. Consequently, most indigenous activities related to rivers are sustainable or at least favorable to free-flowing and healthy rivers.

For both conferring legal rights to river and community-based initiatives, arguments advanced regarding cultural values are those of minority groups except for India. Nonetheless, the “sacred” allegation of the river seems to be quite essential to empower cultural arguments in order to be recognized in Constitution. For instance, what is considered as legal personality needs to be in the center of livelihood of a group of people. Throughout history, the status has expanded but in western word, society’s values and the influential and powerful actors limit this expansion for natural elements and rather stick to corporates (Hutchison 2014). The duality of human and Nature, of nature serving humans present in occidental religion as Christianity is not recognized in native population religious system. Thus, they did not comprehend the idea of selling lands and objectify and exploit nature (Chaturvedi 2019). Parallely, communities which highly rely on water resources are more likely to implement ways of management enabling a good health of rivers and to fight for their rights.

The period or time of settlement of such value is quite irrelevant. First, it often cannot be defined with certainty and secondly, as indigenous groups settled in their lands long before colonization times, they can all be considered as very ancient. It is even more laborious to reconstruct ancient rules for sharing commons because not all of these societies used the written word to transmit heritage. This is another argument to consider those values in modern governance systems. Similar conclusion can be drawn for the ecological status. Further data and indicators must be grasped to equitably compare the state of each river. Nonetheless, they all are endangered by human activities.

Primarily assessment importance of global spiritual link to river does not significantly differentiate the cultural values of management actions preserving rivers for the examples studied. Even so, it does not mean that conservation management types are not territorially linked. A wide range of conditions have been highlighted limiting the expansion of legal

personality to river at an international scale. Community-based initiatives are more geographically dispersed but an assessment of their occurrence regarding rivers in western and eastern world might result in a higher frequency in the eastern part of the world. This would corroborate the hypothesis that initiatives for preserving rivers are dependent of the importance of cultural values.

CONCLUSION: ASSESSING CULTURAL VALUES

If conferring rights to rivers consequently creates legal standing for it, it is not implemented the same way in the different countries. For instance, Colombia and Ecuador recognized Nature as a living being with whom to coexist, India created a special tribunal to deal with environmental issues and New Zealand, by the act of giving Whanganui river legal personhood, protects rights of the river and indigenous population. Other legal initiatives can be found in European countries: France recognized the ecological prejudice in the “Charte de l’environnement” (Deleuil 2020). In the multiple examples discussed, New Zealand remains the only country to simultaneously treat social and environmental issues. A territorial translation of similar measures could be applied internationally. Water issues and shortage can be found in every part of the globe as well as cultural connection with it. Initiatives from civil or law actors could build a new framework, tackling both socio-cultural and ecological problems.

Literature on community-based initiatives generally draw satisfying outcomes when sincere participation is reached: recognition and inclusion of communities’ values and livelihood, less cost of time and money for governments and improvement of democracy and governance. Even if several challenges can be found, solutions are also numerous and can easily be applicated if relevant stakeholders support them. Regarding socio-cultural arguments, it seems that they are numerous and of different nature in river basin where there is a real desire from population to participate to management. In Australian, Asian and Pakistani examples, concerned communities are indigenous communities or minorities whose rights, ownership and way of living are not or were not recognized by the government. Nonetheless, every stakeholder interest and needs must be integrated in the decision process to guarantee efficiency, satisfaction, and sustainability of the method. Hence, socio-cultural values and interests of people living along and sharing their existence with the river have to be fully accepted and taken into account. Values might seem more important for communities whose livelihood depend on fishing, aquaculture or agriculture. Nonetheless, those values can also be found in western countries alongside with different types of cultural values. At a local scale, wealthy inhabitants need to rebuild the direct link between human physical and spiritual wellbeing and environment wellbeing.

Both legal rights and community-based management can achieve better preservation of hydrosystems, and their outcomes could be complementary. Where conferring legal rights permit to achieve legal consideration, abolish human over-exploitation based on ownership

and enable standing in judicial process; community-based initiatives enable better participation and awareness of population, a more holistic gathering of information and generally more adapted and sustainable solutions. Stakeholders are also various: population, associations, NGOs, Government, Judicial Institutions... yet private actors are missing from case studies. Nonetheless, they can also play their part in the two conservation process exposed especially through investment. Even if they are based on the same main principles, practical outcomes of both solutions and each case are different. Build upon similar and comparable socio-cultural arguments, they difference relies on the stakeholders and the legal tools of the country. However, those arguments are different in western countries where there are no “indigenous” people and where beliefs put humans in a central place, reducing nature as an object to serve his interests. Then in European countries, arguments have to be based upon recreational, amenity and knowledge values for examples. Injustice and violence are being fought via manifestations, similar movements could be embedded by population to stand for it in the name of justice and harmony values.

The preliminary assessment of cultural values linked with rivers highlight diverse synergies influenced by legal, social and cultural environment of studied area. Similar cultural arguments could be used in both management strategies and population concerned can represent the same proportion as well. If by nature, the indigenous values are slightly different, they cannot be distinguished in a scale of settlement time. All in all, it seems that legal status and community-based initiatives could be based upon similar cultural arguments regarding river preservation. However, those arguments need to be anchored in a territorial dimension.

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Socio -cultural arguments and management strategies for river conservation: perspective from legal rights and community-based management

Abstract: (250 words)

Construction of dams, pollution and excessive exploitation are threatening our rivers flow, health, and wilderness. Furthermore, it also threatens cultural values interconnected with free-flowing rivers including traditional, recreational, religious values but also spiritual and intrinsic values. This paper examines the socio-cultural arguments used in two considered successful management strategies to preserve rivers: conferring legal rights to the river and community-based initiatives. New Zealander, Indian, Colombian, and Ecuadorian case studies are examined for the former and Australian, South-East Asian and Pakistani initiatives are examined for the latter. Even if they are based on the same main principles, practical outcomes of both solutions and each case are different. Build upon similar and comparable socio-cultural arguments, they difference relies on the stakeholders and the legal tools of the country. However, those arguments are different in western countries where there are no “indigenous” people and where beliefs put human in a central place, reducing nature as an object to serve our interests. Then, there, arguments have to be based upon recreational, amenity and knowledge values and connection between people and the river has to be rebuilt and redemonstrated to spark their standing for both Nature and their own rights.

Key Words: “cultural values”, “legal personality status for river”, “community-based management of river”, “assessing values”, “Whanganui river”, “Ganga river”, “Yumana river”, “Atrato river”, “Vilcabamba river”, “Murray-Darling Basin”, “Fitzroy river”, “Mekong river”, “Indus river”